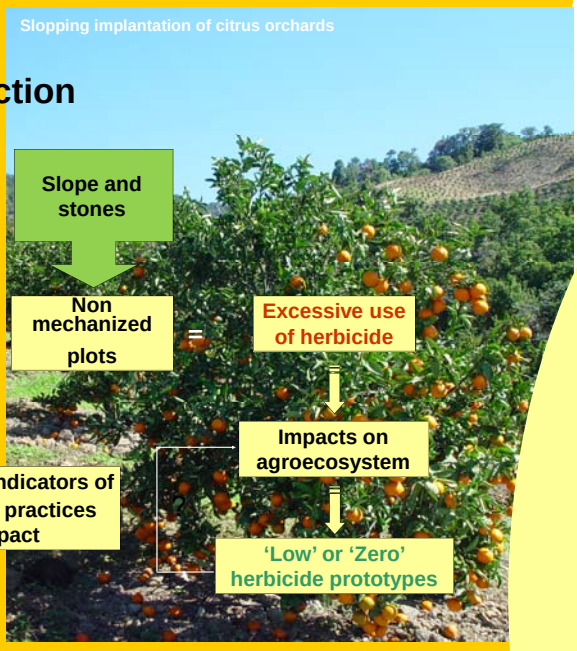
# Phytoseiid mites are bio-indicators of agricultural practice impact on the agroecosystem functioning: The case of weed management in citrus orchards

**F. Le Bellec[1], J. Mailloux[1], P. Dubois[1], A. Rajaud[1], S. Kreiter[2], C. Bockstaller[3], M. S. Tixier[2] and E. Malézieux[4]**

[1] CIRAD, UPR Hortsys, Stn de Vieux-Habitants, Guadeloupe, 97119, Vieux-Habitants, France
[2] Montpellier SupAgro, UMR CBGP 1062 INRA/IRD/CIRAD/SupAgro, CS 30016, 34988 Montferrier sur Lez cedex, France
[3] INRA, UMR 1121 Nancy-Université - INRA, IFR, 110, BP 20507, 68021 Colmar, France
[4] CIRAD, UPR103, TA B-103/PS4 - BD de la Lironde – 34398 Montpellier cedex 5, France

## ▪ Introduction




Phytoseiid mite (200-500 µm)

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## ▪ Material and methods

➢**Six different** weed management prototypes:

| Spontaneous native vegetation | | | | Sown leguminous *Neonotonia wightii* | |
|---|---|---|---|---|---|
| GLY | AV | PV | LMV | ANEO | PNEO |
| Glyphosate | Yearly vegetation | Perennial vegetation | Late mowed vegetation | Yearly ground cover | Perennial ground cover |
| 5 herbicide/year | 5 mows/year + 1 herb./year | 5 mows/year | 1 mow/year | 5 mows/year | No intervention |

➢**Monthly** survey of **density** and **species richness** of Phytoseiidae (from October 2008 to July 2009) for six weed managements prototypes.

➢**Reciprocal Simpson's diversity index (1/D)**

➢According to **density and diversity** of Phytoseiidae, **rank of prototypes** by **level of habitat disturbance** (Mailloux *et al*., 2010)

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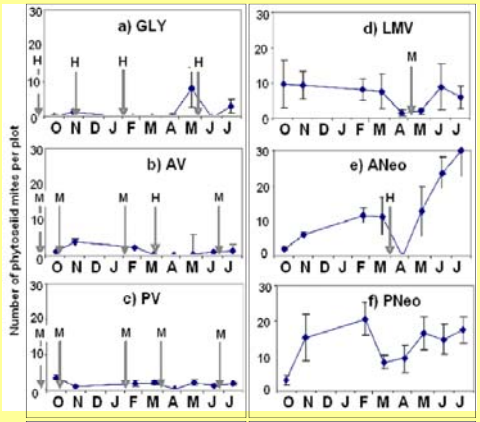
Experimental device

## ▪ Results

Evolution of phytoseiid mites density in ground cover vegetation under different weed managements




| Item | Diversity index value | Phytoseiid mite density per plot | Number of intervention/year |
|---|---|---|---|
| Gly | Low | Low (1.5 mites) | 4 |
| AV | Low | Low (1.2 mites) | 5 |
| PV | Low | Low (1.4 mites) | 5 |
| LMV | High | High (6.9 mites) | 1 |
| ANeo | High | High (13.5 mites) | 1 |
| PNeo | High | High (13.4 mites) | 0 |

➢ Intervention on ground cover vegetation → **decrease in phytoseiid mites density and diversity**;

➢Mechanical weeding is as much disturbing for Phytoseiidae as glyphosate treatment;

➢The **level of disturbance** is linked with the **rate of treatment** rather than with weeding practices

## ▪ Conclusions

✓ Phytoseiidae mites are sensitive to the rate of ground cover treatment

✓ Frequency of ground cover treatments = an indicator of habitat disturbance

✓ **Phytoseiidae mites are indirect indicators of habitat disturbance**

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